

What is claimed is:

1. An apparatus for treating at least one of sleep apnea and snoring in a human or an animal having an oropharyngeal region and an epiglottis, the apparatus comprising:

an appliance sized and structured to be placed in a given position in the oropharyngeal region, other than to facilitate a surgical procedure, and being effective in treating at least one of sleep apnea and snoring, the appliance being further effective, when so placed, to provide at least one additional benefit relative to a device sized and structured for placement in a position in a human or animal other than in the given position in the oropharyngeal region when the device is placed in the given position in the oropharyngeal region.

2. The apparatus of claim 1 wherein the appliance is sized so that, when so placed in the given position in the oropharyngeal region, the appliance is located substantially entirely in the oropharyngeal region.

3. The apparatus of claim 1 wherein the at least one benefit comprises an enhanced compliance of the appliance with the functioning of at least one of the oropharyngeal region and the epiglottis.

4. The apparatus of claim 1 wherein the at least one benefit comprises an enhanced ability of the appliance to do at least one of provide support against collapse of the oropharyngeal region during sleep, and

allow closure of an airway in the oropharyngeal region during swallowing.

5 5. The apparatus of claim 1 wherein the at least one benefit comprises an enhanced ability of the appliance to be tolerated by the human or animal in the given position.

10 6. The apparatus of claim 1 wherein the appliance has an effective non-constrained diameter of at least about 32 mm.

15 7. The apparatus of claim 1 wherein the appliance comprises a member defining a substantially C-shaped configuration.

20 8. The apparatus of claim 1 wherein the appliance, when located outside a human or animal, comprises a substantially flat member.

25 9. The apparatus of claim 1 wherein the appliance is sized and structured to permit substantially natural movement of the epiglottis when the appliance is located in the given position in the oropharyngeal region of the human or animal.

30 10. The apparatus of claim 1 wherein the appliance includes spaced apart, radiused end portions.

30 11. The apparatus of claim 1 wherein the appliance includes end portions and is further sized and

structured, when the appliance is located in the given position, to be positioned against a portion of a posterior wall of the oropharyngeal region with the end portions being spaced apart anteriorly of the posterior
5 wall.

12. The apparatus of claim 1 wherein the appliance comprises a member having a substantially elliptical configuration.

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13. The apparatus of claim 1 wherein the appliance comprises a super-elastic material.

14. The apparatus of claim 1 wherein the appliance
15 comprises Nitinol.

15. The apparatus of claim 1 wherein the appliance includes spaced apart end portions and a length defined between the end portions, and the appliance comprises a
20 plurality of struts extending along at least a substantial portion of the length.

16. The apparatus of claim 1 wherein the appliance comprises a cuff-shaped member.

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17. The apparatus of claim 16 wherein the cuff-shaped member includes spaced apart end portions.

18. The apparatus of claim 17 wherein the cuff-shaped member is sized and structured to be positioned
30 against a portion of a posterior wall of the

oropharyngeal region with the end portions spaced apart by a portion of an anterior wall of the oropharyngeal region.

5 19. An apparatus for treating a human or animal having a pharyngeal region, the apparatus comprising:

 an appliance sized and structured to be placed, at least partially submucosally, within the pharyngeal region of the human or animal and to be effective, when
10 so placed, to maintain patency of the pharyngeal region during natural sleep of the human or animal.

 20. The apparatus of claim 19 wherein the appliance is structured to be effective in treating at
15 least one of sleep apnea and snoring.

 21. The apparatus of claim 19 wherein the appliance is structured to be effective in treating sleep apnea.
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 22. The apparatus of claim 19 wherein the appliance is structured to be placed in an oropharyngeal region.

25 23. The apparatus of claim 19 wherein the appliance is sized to be placed at least partially circumscribing an interior hollow passage defined by the pharyngeal region.

30 24. The apparatus of claim 19 wherein the appliance is sized to be placed at least partially

circumscribing an interior hollow passage defined by an oropharyngeal region.

25. The apparatus of claim 19 wherein the
5 appliance is sized to be placed circumscribing an interior hollow passage defined by the pharyngeal region.

26. The apparatus of claim 19 wherein the
10 appliance is sized to be placed circumscribing, at least once, an interior hollow passage defined by the pharyngeal region.

27. The apparatus of claim 19 wherein the
15 appliance comprises at least one elongated element.

28. The apparatus of claim 19 wherein the appliance comprises a single elongated element.

20 29. The apparatus of claim 19 wherein the appliance comprises at least one elongated element having a polygonal cross-section.

30. The apparatus of claim 19 wherein the
25 appliance comprises at least one elongated element having a rounded cross-section.

31. The apparatus of claim 19 wherein the
30 appliance is structured to be substantially entirely submucosally placed within the pharyngeal region.

32. The apparatus of claim 19 wherein the pharyngeal region has right and left lateral walls, and the appliance is structured to be implanted, at least partially submucosally, within the pharyngeal region, such that the appliance at least partially traverses the right and left lateral walls.

33. The apparatus of claim 19 wherein the pharyngeal region has right and left lateral walls, and the appliance is structured to be implanted, substantially entirely submucosally, within the pharyngeal region, such that the appliance at least partially traverses the right and left lateral walls.

34. The apparatus of claim 19 wherein the appliance comprises a super-elastic material.

35. The apparatus of claim 19 wherein the appliance comprises Nitinol.

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36. An apparatus for treating at least one of sleep apnea and snoring in a human or an animal having an oropharyngeal region and an epiglottis, the apparatus comprising:

25 an appliance sized and structured to be placed in a position in the oropharyngeal region in proximity to the epiglottis, other than to facilitate a surgical procedure, and to be effective in treating at least one of sleep apnea and snoring.

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37. The apparatus of claim 36 wherein the

appliance is structured to be at least partially submucosally placed in the oropharyngeal region.

38. The apparatus of claim 34 wherein the
5 appliance is structured to be substantially entirely submucosally placed in the oropharyngeal region.

39. The apparatus of claim 36 wherein the
10 appliance includes a magnetic component.

40. The apparatus of claim 36 wherein the
appliance is structured to cause tissue stiffening when
the appliance is placed in the position in the
oropharyngeal region.

15 41. The apparatus of claim 36 wherein the oropharyngeal region has lateral walls and the appliance is structured, when so placed in the position, to support lateral walls of the oropharyngeal region
20 against collapse during natural sleep, and to allow closure of an airway in the oropharyngeal region during swallowing.

42. The apparatus of claim 36 wherein the
25 appliance comprises a member defining a substantially C-shaped configuration.

43. The apparatus of claim 36 wherein the
appliance, when located outside a human or animal,
30 comprises a substantially flat member.

44. The apparatus of claim 36 wherein the appliance is sized to permit substantially natural movement of the epiglottis when the apparatus is located in the position.

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45. The apparatus of claim 36 wherein the appliance includes spaced apart, radiused end portions.

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46. The apparatus of claim 36 wherein the appliance includes spaced apart end portions and is further sized and structured to be positioned against a portion of a posterior wall of the oropharyngeal region with the end portions spaced apart by a portion of an

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47. The apparatus of claim 36 wherein the appliance has a resiliency and flexibility to allow natural functioning of the oropharyngeal region during swallowing and a hoop strength effective to support the oropharyngeal region against collapse during natural sleep.

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48. The apparatus of claim 36 wherein the appliance comprises a super-elastic material.

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49. The apparatus of claim 36 wherein the appliance comprises Nitinol.

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50. An apparatus for treating at least one of sleep apnea and snoring in a human or an animal having

an oropharyngeal region including lateral walls and an epiglottis, the apparatus comprising:

an appliance sized and structured to be placed in a position in the oropharyngeal region in proximity to the epiglottis, other than to facilitate a surgical procedure, and being effective in treating at least one of sleep apnea and snoring, the appliance being structured, when placed in the position in the oropharyngeal region, to support the lateral walls of the oropharyngeal region against collapse during the time the human or animal is naturally sleeping.

51. The apparatus of claim 50 wherein the appliance is sized so that, when placed in the position in the oropharyngeal region, the appliance is located substantially entirely in the oropharyngeal region.

52. A method for treating at least one of sleep apnea and snoring in a human or an animal having an oropharyngeal region, a vallecular space and an epiglottis, the method comprising:

providing an appliance in the oropharyngeal region of the human or animal, the appliance located in the oropharyngeal region being effective in treating at least one of sleep apnea and snoring during natural sleep of the human or animal.

53. The method of claim 52 wherein the appliance, when located in the oropharyngeal region, is effective in maintaining patency of the oropharyngeal region during natural sleep of the human or animal without

causing substantial interference with at least one natural function of the epiglottis.

54. The method of claim 52 wherein the step of
5 providing includes inserting the appliance into the oropharyngeal region while the appliance is in a first configuration and allowing the appliance to reconfigure to a second configuration within or in proximity to the oropharyngeal region.

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55. The method of claim 50 wherein the step of providing includes inserting the appliance into the oropharyngeal region through a mouth of the person or animal.

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56. An apparatus for maintaining patency of a human or animal oropharyngeal region having lateral walls, in order to control at least one of sleep apnea and snoring, the apparatus comprising:

20 an appliance comprising a body portion and end portions spaced apart by the body portion,

the appliance being structured to take on a deployed configuration when located within the oropharyngeal region, such that the end portions are
25 spaced apart from each other anteriorly of a posterior wall of the oropharyngeal region, and

the appliance being further structured to exert a force on the lateral walls of the oropharyngeal region, when the appliance is in the deployed configuration
30 within the oropharyngeal region, in order to cause the oropharyngeal region to be maintained substantially

unobstructed.

57. The apparatus of claim 56 wherein the end portions are coupled together only through the body
5 portion.

58. The apparatus of claim 56 wherein the appliance is structured to form a relatively flat configuration when the appliance is at rest outside the
10 human or animal.

59. A method for maintaining patency of a pharyngeal region of a human or an animal during natural sleep, the method comprising the steps of:
15 providing a member in a substantially flat or precurved configuration, the member having a body portion and end portions spaced apart by the body portion; and
implanting the member, at least partially
20 submucosally, within the pharyngeal region.

60. The method of claim 59 wherein the pharyngeal region has right and left lateral walls, and the member is effective to provide a substantially constant force
25 against at least a portion of each of the right and left lateral walls.

61. The method of claim 59 wherein the step of implanting comprises implanting the member into
30 pharyngeal region such that the member is substantially entirely submucosally implanted in the pharyngeal

region.

62. A method for maintaining patency of a pharyngeal region of a human or an animal during natural
5 sleep and for purposes other than surgery, the method comprising the steps of:

causing a tissue reaction of a pharyngeal region of a human or animal patient, said tissue reaction being effective in at least one of strengthening and
10 stiffening lateral walls of the pharyngeal region.

63. The method of claim 62 wherein the step of causing a tissue reaction comprises applying an active agent to the lateral walls.

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64. The method of claim 62 wherein the step of causing a tissue reaction comprises placing at least one member into the lateral walls.

20 65. A method for maintaining patency or causing to become patent, open or unobstructed, an pharyngeal region of a human or an animal during natural sleep and for purposes other than surgery, the method comprising the steps of: suturing portions of the pharyngeal region
25 of a human or animal, said suturing being effective in at least one of strengthening and stiffening lateral walls of the pharyngeal region.

66. An apparatus for treating a human or animal
30 having a pharyngeal region, the apparatus comprising:

an appliance sized and structured to be placed

within the pharyngeal region of the human or animal and, when so placed, having an intrinsic ability to maintain patency of the pharyngeal region during natural sleep of the human or animal.

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67. The apparatus of claim 66 wherein the appliance is structured to cause a reduced fibrotic reaction when placed in the pharyngeal region relative to a similar appliance made of polyester.

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68. The apparatus of claim 66 wherein the appliance is structured to inhibit fibrotic reaction when placed in the pharyngeal region.

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69. The apparatus of claim 66 wherein the appliance is structured to cause substantially no fibrotic reaction when placed in the pharyngeal region.

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70. The apparatus of claim 66 wherein the appliance is at least partially made of metal.

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71. The apparatus of claim 66 wherein the appliance has sufficient resiliency to allow substantially normal functioning of an epiglottis of the human or animal.

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72. The apparatus of claim 66 which comprises at least one component structured to at least partially circumscribe the pharyngeal region when placed in the pharyngeal region.

73. The apparatus of claim 66 which comprises at least one member which has a length and a thickness smaller than the length, and which when placed in the pharyngeal region, extends longitudinally a distance
5 greater than the thickness.

74. The apparatus of claim 72 which comprises at least one member which has a length and a thickness smaller than the length, and which when placed in the
10 pharyngeal region, extends longitudinally a distance greater than the thickness.

75. The apparatus of claim 66 which is sized and structured to be placed in the pharyngeal region at
15 least partially submucosally.

76. The apparatus of claim 72 wherein the at least one component is sized and structured to be placed in the pharyngeal region substantially submucosally.
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77. The apparatus of claim 73 wherein the at least one member is sized and structured to be placed in the pharyngeal region substantially submucosally.

25 78. The apparatus of claim 74 wherein one or both of the at least one component and the at least one member is sized and structured to be placed in the pharyngeal region substantially submucosally.

30 79. The apparatus of claim 72 wherein the at least one component has a substantially bow shaped, linear

configuration and is sized and structured to be placed at least partially submucosally within the pharyngeal region substantially transverse to a longitudinal axis of the pharyngeal region.

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80. The apparatus of claim 72 wherein the at least one component comprises a plurality of components.

81. The apparatus of claim 79 wherein the at least
10 one component comprises a plurality of components structured to be placed in the pharyngeal region at spaced apart intervals.

82. The apparatus of claim 73 wherein the at least
15 one member comprises a plurality of the members.

83. The apparatus of claim 74 wherein the at least one member is coupled to the component.

20 84. The apparatus of claim 83 wherein the at least one member comprises a plurality of spaced apart members.

85. The apparatus of claim 74 wherein the
25 component and the at least one member are parts of a single, unitary structure.

86. The apparatus of claim 83 wherein the
30 component and the plurality of members are parts of a single unitary structure.

87. The apparatus of claim 72 wherein the component is substantially bow shaped.

88. The apparatus of claim 66 wherein the
5 appliance includes a transverse portion sized and structured to provide an opening force to the pharyngeal region and at least one longitudinal portion, depending from the transverse portion, structured to be placed substantially submucosally within the pharyngeal region
10 and aligned substantially along a longitudinal axis of the pharyngeal region.

89. The apparatus of claim 88 wherein the at least one longitudinal portion comprises two longitudinal
15 portions depending from the substantially transverse portion.

90. The apparatus of claim 89 wherein the two longitudinal portions are spaced apart by the transverse
20 portion.